

CLAIMS:

Sub A1

1. Surface-modified, pyrogenically produced oxides doped by aerosol.
2. Surface-modified, pyrogenically produced oxides doped by aerosol, characterized in that the oxides are oxides from the group SiO_2 , Al_2O_3 , TiO_2 , B_2O_3 , ZrO_2 , In_2O_3 , ZnO , Fe_2O_3 , Nb_2O_5 , V_2O_5 , WO_3 , SnO_2 , GeO_2 .
3. Surface-modified, pyrogenically produced oxides doped by aerosol in accordance with claim 1 or 2, characterized in that they are surface-modified with one or several compounds from the following groups:
 - a) Organosilanes of the type $(\text{RO})_3\text{Si}(\text{C}_n\text{H}_{2n+1})$ and $(\text{RO})_3\text{Si}(\text{C}_n\text{H}_{2n-1})$
 $\text{R} = \text{alkyl}$
 $n = 1 - 20$
 - b) Organosilanes of the type $\text{R}'_x (\text{RO})_y \text{Si}(\text{C}_n\text{H}_{2n+1})$ and $(\text{RO})_3\text{Si}(\text{C}_n\text{H}_{2n+1})$
 $\text{R}' = \text{alkyl}$
 $\text{R}' = \text{cycloalkyl}$
 $N = 1 - 20$

Sub A)
cont.

$$x+y = 3$$

$$x = 1, 2$$

$$y = 1, 2$$

c) Halogen organosilanes of the type $X_3 Si(C_nH_{2n+1})$ and $X_3 Si(C_nH_{2n-1})$

$X = Cl, Br$

$n = 1 - 20$

d) Halogen organosilanes of the type $X_2 (R') Si(C_nH_{2n+1})$ and

$X_2 (R') Si(C_nH_{2n-1})$

$X = Cl, Br$

$R' = alkyl$

$R' = cycloalkyl$

$n = 1 - 20$

e) Halogen organosilanes of the type $X (R')_2 Si(C_nH_{2n+1})$ and

$X (R')_2 Si(C_nH_{2n-1})$

$X = Cl, Br$

$R' = alkyl$

$R' = cycloalkyl$

$n = 1 - 20$

f) Organosilanes of the type $(RO)_3 Si(CH_2)_m R'$

Sub A1
Cont.

$R = \text{alkyl}$

$m = 0.1 - 20$

$R' = \text{methyl-, aryl (e.g., } -C_6H_5, \text{ substituted phenyl groups)}$

$-C_4F_9, OCF_2-\text{CHF-CF}_3, -C_6F_{13}, -O-\text{CF}_2-\text{CHF}_2$

$-\text{NH}_2, =\text{N}_3, -\text{SCN}, -\text{CH}=\text{CH}_2, -\text{NH}-\text{CH}_2-\text{CH}_2-\text{NH}_2,$

$-\text{N}-(\text{CH}_2-\text{CH}_2-\text{CH}_2\text{NH}_2)_2$

$-\text{OOC}(\text{CH}_3)\text{C}=\text{CH}_2$

$-\text{OCH}_2-\text{CH}(\text{O})\text{CH}_2$

$-\text{NH}-\text{CO}-\text{N}-\text{CO}- (\text{CH}_2)_5$

$-\text{NH}-\text{COO}-\text{CH}_3, -\text{NH}-\text{COO}-\text{CH}_2-\text{CH}_3, -\text{NH}-(\text{CH}_2)_3\text{Si}(\text{OR})_3$

$-\text{S}_x-(\text{CH}_2)_3\text{Si}(\text{OR})_3$

$-\text{SH}$

$-\text{NR}'\text{R}''\text{R}''' \quad (\text{R}' = \text{alkyl, aryl}; \text{R}'' = \text{H, alkyl, aryl}; \text{R}''' = \text{H, alkyl, aryl, benzyl}, \text{C}_2\text{H}_4\text{NR}'''' \quad \text{R}'''' \text{ with R}'''' = \text{A, alkyl and R}'''' = \text{H, alkyl})$

g) Organosilanes of the type $(\text{R}'')_x (\text{RO})_y \text{Si}(\text{CH}_2)_m-\text{R}'$

$\text{R}'' = \text{alkyl} \quad x+y = 2$

$= \text{cyclolalkyl} \quad x = 1, 2$

$y = 1, 2$

$m = 0.1 \text{ to } 20$

$\text{R}' = \text{methyl-, aryl (e.g., } -C_6H_5, \text{ substituted phenyl groups)}$

$-C_4F_9, -OCF_2-\text{CHF-CF}_3, -C_6F_{13}, -O-\text{CF}_2-\text{CHF}_2$

Sub A1
cont.

-NH₂, -N₃, SCN, -CH=CH₂, -NH-CH₂-CH₂-NH₂,
-N-(CH₂-CH₂-NH₂)₂
-OOC(CH₃)C=CH₂
-OCH₂-CH(O)CH₂
-NH-CO-N-CO-(CH₂)₅
-NH-COO-CH₃, -NH-COO-CH₂-CH₃, -NH-(CH₂)₃Si(OR)₃
-S_x-(CH₂)₃Si(OR)₃
-SH
-NR'R''R''' (R' = alkyl, aryl; R'' = H, alkyl, aryl; R''' = H, alkyl, aryl, benzyl, C₂H₄NR'''' R''''' with R''''' = A, alkyl and R'''' = H, alkyl)

h) Halogen organosilanes of the type X₃Si(CH₂)_m-R'

X = Cl, Br

m = 0, 1 - 20

R' = methyl-, aryl (e.g., -C₆H₅, substituted phenyl groups)

-C₄F₉, -OCF₂-CHF-CF₃, -C₆F₁₃, -O-CF₂-CHF₂
-NH₂, -N₃, SCN, -CH=CH₂, -NH-CH₂-CH₂-NH₂,
-N-(CH₂-CH₂-NH₂)₂
-OOC(CH₃)C=CH₂
-OCH₂-CH(O)CH₂
-NH-CO-N-CO-(CH₂)₅

Sub A1
cont.

-NH-COO-CH₃, -NH-COO-CH₂-CH₃, -NH-(CH₂)₃Si(OR)₃

-S_x-(CH₂)₃Si(OR)₃

-SH

i) Halogen organosilanes of the type (R)X₂Si(CH₂)_m-R'

X = Cl, Br

R = alkyl such as methyl, - ethyl-, propyl-

m = 0, 1 - 20

R' = methyl, aryl (e.g., -C₆H₅, substituted phenyl groups)

-C₄F₉, -OCF₂-CHF-CF₃, -C₆F₁₃, -O-CF₂-CHF₂

-NH₂, -N₃, SCN, -CH=CH₂, -NH-CH₂-CH₂-NH₂,

-N-(CH₂-CH₂-NH₂)₂

-OOC (CH₃)C = CH₂

-OCH₂-CH(O) CH₂

-NH-CO-N-CO-(CH₂)₅

-NH-COO-CH₃, -NH-COO-CH₂-CH₃, -NH-

(CH₂)₃Si(OR)₃

-S_x-(CH₂)₃Si(OR)₃

-SH

(j) Halogen organosilanes of the type (R)₂X Si(CH₂)_m-R'

X = Cl, Br

R = alkyl

~~Sub A~~
cont.

~~m = 0, 1 - 20~~

~~R = methyl-, aryl (e.g., -C₆H₅, substituted phenyl groups)~~

~~-C₄F₉, -OCF₂-CHF-CF₃, -C₆F₁₃, -O-CF₂-CHF₂~~

~~-NH₂, -N₃, SCN, -CH=CH₂, -NH-CH₂-CH₂-NH₂,~~

~~-N-(CH₂-CH₂-NH₂)₂~~

~~-OOC(CH₃)C=CH₂~~

~~-OCH₂-CH(O)CH₂~~

~~-NH-CO-N-CO-(CH₂)₅~~

~~-NH-COO-CH₃, -NH-COO-CH₂-CH₃, -NH-(CH₂)₃Si(OR)₃~~

~~-S_x-(CH₂)₃Si(OR)₃~~

~~-SH~~

(k) Silazanes of the type R'R₂Si-N-SiR₂R'

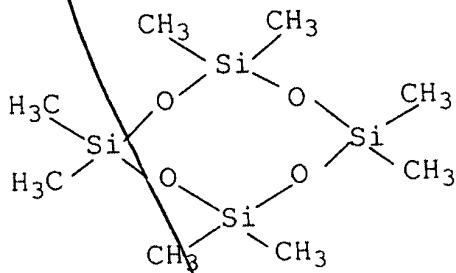
H

R = alkyl

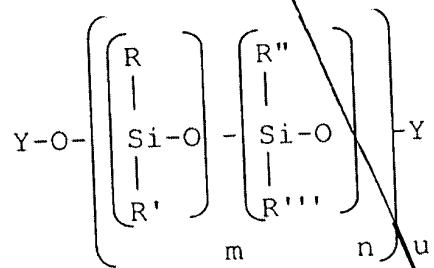
R' = alkyl, vinyl

(l) Cyclic polysiloxanes of the type D₃, D₄, D₅, e.g.
octamethylcyclotetrasiloxane = D₄

Sub A2
cont.



m) Polysiloxanes or silicone oils of the type

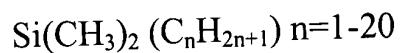
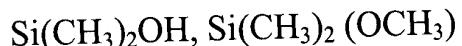


$$m = 0, 1, 2, 3, \dots \infty$$

$$n = 0, 1, 2, 3, \dots \infty$$

$$u = 0, 1, 2, 3, \dots \infty$$

$$Y = CH_3, H, C_nH_{2n+1} \quad n=1-20$$
$$Y = Si(CH_3)_3, Si(CH_3)_2H$$



R = alkyl, aryl, (CH₂)_n-NH₂, H

R' = alkyl, aryl, (CH₂)_n-NH₂, H

R'' = alkyl, aryl, (CH₂)_n-NH₂, H

R''' = alkyl, aryl, (CH₂)_n-NH₂, H

Sub A
cont.

4. A method of producing the surface-modified oxides in accordance with claim 1 or 2, characterized in that pyrogenically produced oxides doped by aerosol are placed in a suitable mixing container, the oxides are sprayed under intensive mixing, optionally with water and/or acid at first and subsequently with a surface-modification reagent or a mixture of several surface-modification reagents, optionally re-mixed 15 to 30 minutes and tempered at a temperature of 100 to 400 °C for a period of 1 to 6 hours.

5. The use of the surface-modified oxides as reinforcing filler.

Dodd A2